

WAKELIN'S
REVISED HANDY
TABLE BOOK

*of Arithmetic, Money,
Weights and Measures,*

INCLUDING

FULL TABLES of the METRIC SYSTEM
and a Variety of Useful Information.

FULLY EXPLAINED WITH NOTES.

PRICE - SIXPENCE

JOHN HEYWOOD, LTD.,
Wholesale Newsagents, Booksellers & Stationers,
121, DEANSGATE, MANCHESTER. 3

LIST OF CONTENTS

Abbreviations, list of	4th page of cover		
Addition and Subtraction	Tables	....	4
Ale and Beer Measure	....	....	19
Angular or Circular Measure	....	....	19
Apothecaries' Fluid Measure	....	....	17
Apothecaries' Weight	....	....	17
Arithmetic	....	....	1
Arithmetical Signs	....	....	3
Avoirdupois Weight	....	....	16
Barometer, etc.	....	....	22
Bread Weight	....	....	18
Capital Cities of the Principal			
Countries of the World	....	....	32
Chronological Table	....	....	12-13
Circular or Angular Measure	....	....	19
Cloth Measure	....	....	15
Coinage of Great Britain	....	....	8
Commercial Numbers	....	....	26
Comparison of Time			
3rd page of cover			
Cubic Measure	....	....	16
Customary Weights and			
Measures	....	....	28
Days of each Month	....	....	20
Decimals	....	....	23
Decimal and Vulgar Fractions	....	....	25
Degree, divisions of a	....	....	19
Degree, Measurements of a,			
at various Latitudes	....	....	21
Division Table in squares	....	....	7
Dry Measure	....	....	18
Electrical Measures	....	....	22
English and Foreign Miles			
compared	....	....	15
English Kings and Queens	....	....	30
Farthings Table	....	....	9
Fractions	....	....	3
Fractions, Vulgar and Decimal	....	....	25
Geographical or Nautical			
Measure	....	....	15
Hay and Straw Weight	....	....	17
How to tell the days of the			
month	....	....	20
How to tell Leap Year	....	....	20
Imported Wines	....	....	18
Involution	....	....	25
Kings and Queens of England	....	....	30
Land Measure (length)	....	....	14
Land Measure (surface)	....	....	15
Long Measure	....	....	14
Measures of Time and Motion	....	....	19
Mental Arithmetical Aids	....	....	26
Metric System:—			
Measures of Length	....	....	23
Measures of Surface	....	....	24
Measures of Solidity	....	....	24
Measures of Capacity	....	....	24
Measures of Weight	....	....	25
Money Tables	....	....	8
Months of the Year	....	....	20
Miscellaneous Weights and			
Measures	....	....	28
Multiplication and Division			
Table in squares	....	....	7
Multiplication Tables	....	....	5
Nautical or Geographical			
Measure	....	....	15
Notation and Numeration	....	....	1-2
Old English Coins (not in use			
now)	....	....	8
Pence Table	....	....	10
Planetary System	....	....	21
Practice Tables	....	....	27
Quarter Days	....	....	20
Roman Numerals	....	....	2
Seasons, the	....	....	21
Shillings Table	....	....	11
Square, Surface or Land			
Measure	....	....	15
Subtraction Table	....	....	4
Suggested English Coinage			
(Metric)	....	....	25
Thermometers	....	....	22
Time and Motion, measures			
of	....	....	19
Troy Weight	....	....	17
Vulgar and Decimal Fractions	....	....	25
Weights and Measures	....	....	14
Wool Weight	....	....	17
Wheaten Bread	....	....	18
Wine and Spirit Measure	....	....	18

ARITHMETICAL TABLE BOOK.

ARITHMETIC.

ARITHMETIC is the science of numbers, or the art of computation, and is derived from the Greek word "arithmos," meaning number. It is divided into Five Rules, which the following Tables are intended to elucidate, viz: Notation or Numeration, Addition, Subtraction, Multiplication, and Division.

Notation is the art of expressing numbers by means of figures. Thus, six hundred and fifteen is expressed by 615.

Numeration is the art of reading, or expressing in words, figures indicating numbers; thus 3278 is expressed by the words three thousand two hundred and seventy-eight. Hence numeration is the converse or opposite of notation.

Addition is the art of adding several numbers or sums together so as to make one whole or total sum.

Subtraction teaches how to take a less number from a greater. What is left is called the *Difference* or *Remainder*.

Multiplication is the method of finding what a number will amount to when added to itself a given number of times.

Division is the method by which we find how many times a less number is contained in a greater.

NOTATION AND NUMERATION.

The Arabic figures are 1, one; 2, two; 3, three; 4, four; 5, five; 6, six; 7, seven; 8, eight; 9, nine; which with the help of the cipher, 0, serve to express all our numbers. The Roman numerals are I, one; V, five; X, ten; L, fifty; C, a hundred; D, five hundred; and M, one thousand. The Chapters in the Bible and books, and the dial plates of watches, clocks, etc., are usually numbered with these characters.

TABLE OF ROMAN NUMERALS.

1..I.	13..XIII.	45..XLV.	200..CC.
2..II.	14..XIV.	50..L.	300..CCC.
3..III.	15..XV.	55..LV.	400..CD.
4..IV. or IIIL.	16..XVI.	60..LX.	500..D.
5..V.	17..XVII.	65..LXV.	600..DC.
6..VI.	18..XVIII.	70..LXX.	700..DCC.
7..VII.	19..XIX.	75..LXXV.	800..DCCC.
8..VIII.	20..XX.	80..LXXX.	900..CM.
9..IX.	25..XXV.	85..LXXXV.	1000..M.
10..X.	30..XXX.	90..XC.	1500..MD.
11..XI.	35..XXXV.	95..XCV.	2000..MM.
12..XII.	40..XL.	100..C.	2500..MMD.

1673—MDCLXXIII.

1910—MCMX.

NUMERATION TABLE.

Units	1	} Hundreds.
Tens	21	
Hundreds	321	
Thousands	4,321	} Thousands.
Tens of Thousands.....	54,321	
Hundreds of Thousands.....	654,321	
Millions	7,654,321	} Millions.
Tens of Millions	87,654,321	
Hundreds of Millions	987,654,321	

This table embodies the first principles of arithmetic. By it we see that a figure varies in value according to its place in a row of figures, and that its value is multiplied by ten at each removal to the left of the unit's place. Thus, 1 in the ten's place is worth ten times 1 in the unit's place, and 1 in the hundred's place is worth a hundred (or 10 times 10) times 1 in the unit's place.

Let us analyze the number 7,654,321, which would be written seven million, six hundred and fifty-four thousand, three hundred and twenty-one.

The 1=1 unit=1 × 1=	1
The 2=2 tens=2 × 10=	20
The 3=3 hundreds=3 × 100=	300
The 4=4 thousands=4 × 1,000=	4,000
The 5=5 tens of thousands=5 × 10,000=	50,000
The 6=6 hundreds of thousands=6 × 100,000=	600,000
The 7=7 millions=7 × 1,000,000=	7,000,000

Now add, and we get the original number ... 7,654,321

ARITHMETICAL SIGNS.

- + plus, or { The sign of *Addition*; as $6+3=9$, shows that 6
more. { added to 3 is equal to 9.
- minns, { The sign of *Subtraction*; as $7-4=3$, shows that 4
or less. { subtracted from 7 leaves 3 remaining.
- \times multi- { The sign of *Multiplication*; as $8 \times 9=72$; that is 8
plied by. { multiplied by 9 is equal to 72.
- \div divided { The sign of *Division*; as $36 \div 4=9$, expresses that 36
by. { divided by 4 gives 9 as the quotient.
- = equal to { The sign of *Equality*; for example, $4+2=6$, which
shows that 4 added to 2 is equal to 6.
- : is to
:: so is
: to { Signify *Proportion*, as $1:2::3:6$. These figures are
thus read: as 1 is to 2 so is 3 to 6.
- \therefore signifies *therefore*; \because denotes *because*.

The sign $\sqrt{}$ placed before a number shows that its square root is to be taken, that is to say, you have to find that number which multiplied by itself, will produce the number before which the sign is placed.

Thus $\sqrt{16}=4$, because $4 \times 4=16$.

In the same way $\sqrt[3]{}$ is the sign of the cube or third root.

e.g. $\sqrt[3]{27}=3$, because $3 \times 3 \times 3=27$.

Again $\sqrt[4]{}$ is the sign of the biquadrate or fourth root.

e.g. $\sqrt[4]{81}=3$, because $3 \times 3 \times 3 \times 3=81$.

FRACTIONS.

Fractions are the parts into which a whole or number is broken up or divided. They are expressed by two numbers placed one above the other and separated by a line. The lower number is called the *Denominator*, and shows into how many equal parts the whole is divided up. The upper number is called the *Numerator*, and shows how many of these parts are taken. Thus $\frac{3}{5}$ of 15 means that fifteen is divided into five equal parts, three of which are taken; $\therefore \frac{3}{5}$ of $15=9$ $\because 15 \div 5=3$, which multiplied by $3=9$.

A fraction whose numerator is greater than its denominator is called an improper fraction; *e.g.*, $\frac{4}{3}$, $\frac{11}{5}$, $\frac{12}{7}$.

ADDITION AND SUBTRACTION TABLE.

1 and	2 and	3 and	4 and	5 and	6 and
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6	1 are 7
2 „ 3	2 „ 4	2 „ 5	2 „ 6	2 „ 7	2 „ 8
3 „ 4	3 „ 5	3 „ 6	3 „ 7	3 „ 8	3 „ 9
4 „ 5	4 „ 6	4 „ 7	4 „ 8	4 „ 9	4 „ 10
5 „ 6	5 „ 7	5 „ 8	5 „ 9	5 „ 10	5 „ 11
6 „ 7	6 „ 8	6 „ 9	6 „ 10	6 „ 11	6 „ 12
7 „ 8	7 „ 9	7 „ 10	7 „ 11	7 „ 12	7 „ 13
8 „ 9	8 „ 10	8 „ 11	8 „ 12	8 „ 13	8 „ 14
9 „ 10	9 „ 11	9 „ 12	9 „ 13	9 „ 14	9 „ 15
10 „ 11	10 „ 12	10 „ 13	10 „ 14	10 „ 15	10 „ 16
11 „ 12	11 „ 13	11 „ 14	11 „ 15	11 „ 16	11 „ 17
12 „ 13	12 „ 14	12 „ 15	12 „ 16	12 „ 17	12 „ 18
1 from	2 from	3 from	4 from	5 from	6 from

7 and	8 and	9 and	10 and	11 and	12 and
1 are 8	1 are 9	1 are 10	1 are 11	1 are 12	1 are 13
2 „ 9	2 „ 10	2 „ 11	2 „ 12	2 „ 13	2 „ 14
3 „ 10	3 „ 11	3 „ 12	3 „ 13	3 „ 14	3 „ 15
4 „ 11	4 „ 12	4 „ 13	4 „ 14	4 „ 15	4 „ 16
5 „ 12	5 „ 13	5 „ 14	5 „ 15	5 „ 16	5 „ 17
6 „ 13	6 „ 14	6 „ 15	6 „ 16	6 „ 17	6 „ 18
7 „ 14	7 „ 15	7 „ 16	7 „ 17	7 „ 18	7 „ 19
8 „ 15	8 „ 16	8 „ 17	8 „ 18	8 „ 19	8 „ 20
9 „ 16	9 „ 17	9 „ 18	9 „ 19	9 „ 20	9 „ 21
10 „ 17	10 „ 18	10 „ 19	10 „ 20	10 „ 21	10 „ 22
11 „ 18	11 „ 19	11 „ 20	11 „ 21	11 „ 22	11 „ 23
12 „ 19	12 „ 20	12 „ 21	12 „ 22	12 „ 23	12 „ 24
7 from	8 from	9 from	10 from	11 from	12 from

Note.—These Tables may be applied to Subtraction by reading backwards, thus:—9 from 21 leaves 12. 11 from 19 leaves 8.

MULTIPLICATION TABLE.

Twice	3 times	4 times	5 times	6 times	7 times
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6	1 are 7
2 ... 4	2 ... 6	2 ... 8	2 ... 10	2 ... 12	2 ... 14
3 ... 6	3 ... 9	3 ... 12	3 ... 15	3 ... 18	3 ... 21
4 ... 8	4 ... 12	4 ... 16	4 ... 20	4 ... 24	4 ... 28
5 ... 10	5 ... 15	5 ... 20	5 ... 25	5 ... 30	5 ... 35
6 ... 12	6 ... 18	6 ... 24	6 ... 30	6 ... 36	6 ... 42
7 ... 14	7 ... 21	7 ... 28	7 ... 35	7 ... 42	7 ... 49
8 ... 16	8 ... 24	8 ... 32	8 ... 40	8 ... 48	8 ... 56
9 ... 18	9 ... 27	9 ... 36	9 ... 45	9 ... 54	9 ... 63
10 ... 20	10 ... 30	10 ... 40	10 ... 50	10 ... 60	10 ... 70
11 ... 22	11 ... 33	11 ... 44	11 ... 55	11 ... 66	11 ... 77
12 ... 24	12 ... 36	12 ... 48	12 ... 60	12 ... 72	12 ... 84
13 ... 26	13 ... 39	13 ... 52	13 ... 65	13 ... 78	13 ... 91
14 ... 28	14 ... 42	14 ... 56	14 ... 70	14 ... 84	14 ... 98
15 ... 30	15 ... 45	15 ... 60	15 ... 75	15 ... 90	15 ... 105
16 ... 32	16 ... 48	16 ... 64	16 ... 80	16 ... 96	16 ... 112

8 times	9 times	10 times	11 times	12 times	13 times
1 are 8	1 are 9	1 are 10	1 are 11	1 are 12	1 are 13
2 ... 16	2 ... 18	2 ... 20	2 ... 22	2 ... 24	2 ... 26
3 ... 24	3 ... 27	3 ... 30	3 ... 33	3 ... 36	3 ... 39
4 ... 32	4 ... 36	4 ... 40	4 ... 44	4 ... 48	4 ... 52
5 ... 40	5 ... 45	5 ... 50	5 ... 55	5 ... 60	5 ... 65
6 ... 48	6 ... 54	6 ... 60	6 ... 66	6 ... 72	6 ... 78
7 ... 56	7 ... 63	7 ... 70	7 ... 77	7 ... 84	7 ... 91
8 ... 64	8 ... 72	8 ... 80	8 ... 88	8 ... 96	8 ... 104
9 ... 72	9 ... 81	9 ... 90	9 ... 99	9 ... 108	9 ... 117
10 ... 80	10 ... 90	10 ... 100	10 ... 110	10 ... 120	10 ... 130
11 ... 88	11 ... 99	11 ... 110	11 ... 121	11 ... 132	11 ... 143
12 ... 96	12 ... 108	12 ... 120	12 ... 132	12 ... 144	12 ... 156
13 ... 104	13 ... 117	13 ... 130	13 ... 143	13 ... 156	13 ... 169
14 ... 112	14 ... 126	14 ... 140	14 ... 154	14 ... 168	14 ... 182
15 ... 120	15 ... 135	15 ... 150	15 ... 165	15 ... 180	15 ... 195
16 ... 128	16 ... 144	16 ... 160	16 ... 176	16 ... 192	16 ... 208

MULTIPLICATION TABLE (*continued.*)

14 times	15 times	16 times	17 times	18 times	19 times
1are14	1are15	1are16	1are17	1are18	1are19
2... 28	2... 30	2... 32	2... 34	2... 36	2... 38
3... 42	3... 45	3... 48	3... 51	3... 54	3... 57
4... 56	4... 60	4... 64	4... 68	4... 72	4... 76
5... 70	5... 75	5... 80	5... 85	5... 90	5... 95
6... 84	6... 90	6... 96	6... 102	6... 108	6... 114
7... 98	7... 105	7... 112	7... 119	7... 126	7... 133
8... 112	8... 120	8... 128	8... 136	8... 144	8... 152
9... 126	9... 135	9... 144	9... 153	9... 162	9... 171
10... 140	10... 150	10... 160	10... 170	10... 180	10... 190
11... 154	11... 165	11... 176	11... 187	11... 198	11... 209
12... 168	12... 180	12... 192	12... 204	12... 216	12... 228
13... 182	13... 195	13... 208	13... 221	13... 234	13... 247
14... 196	14... 210	14... 224	14... 238	14... 252	14... 266
15... 210	15... 225	15... 240	15... 255	15... 270	15... 285
16... 224	16... 240	16... 256	16... 272	16... 288	16... 304

20 times	21 times	22 times	23 times	24 times	25 times
1are20	1are21	1are22	1are23	1are24	1are25
2... 40	2... 42	2... 44	2... 46	2... 48	2... 50
3... 60	3... 63	3... 66	3... 69	3... 72	3... 75
4... 80	4... 84	4... 88	4... 92	4... 96	4... 100
5... 100	5... 105	5... 110	5... 115	5... 120	5... 125
6... 120	6... 126	6... 132	6... 138	6... 144	6... 150
7... 140	7... 147	7... 154	7... 161	7... 168	7... 175
8... 160	8... 168	8... 176	8... 184	8... 192	8... 200
9... 180	9... 189	9... 198	9... 207	9... 216	9... 225
10... 200	10... 210	10... 220	10... 230	10... 240	10... 250
11... 220	11... 231	11... 242	11... 253	11... 264	11... 275
12... 240	12... 252	12... 264	12... 276	12... 288	12... 300
13... 260	13... 273	13... 286	13... 299	13... 312	13... 325
14... 280	14... 294	14... 308	14... 322	14... 336	14... 350
15... 300	15... 315	15... 330	15... 345	15... 360	15... 375
16... 320	16... 336	16... 352	16... 368	16... 384	16... 400

MULTIPLICATION AND DIVISION TABLE IN SQUARES.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176
12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208
14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224
15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240
16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256

Examples:— To multiply 7 by 13, run your finger along row 7 until you come to the number in that row which is in column 13. This is 91 the required product.

To divide 144 by 12, run your finger along row 12 until it comes to the number 144; then run the finger up the column in which it stands; at the top is 12 the required quotient.

MONEY TABLES.

English Sterling Money consists of a variety of coins in gold, silver and bronze. The following are the coins at present in circulation:—

Gold: sovereign (20s.); half-sovereign (10s.);

Silver: crown (5s.); double-florin (4s.); half-crown (2s. 6d.); florin (2s.); shilling (1s.); sixpence (6d.); threepenny piece (3d.).

Bronze: penny (1d.); halfpenny ($\frac{1}{2}$ d.); farthing ($\frac{1}{4}$ d.).

£ s. d. are the first letters of three Latin words: *Libra* (pound), a Roman weight; *Solidus* (shilling), and *Denarius* (penny)—Roman coins. These are commonly used as the signs for pounds, shillings, and pence.

TABLE OF COINS AND THEIR VALUE IN SHILLINGS, PENCE, AND FARTHING.

Name.	No. of Shillings	No. of Pence	No. of Farthings
Sovereign =	20	240	960
Half-sovereign =	10	120	480
Crown =	5	60	240
Double-florin =	4	48	192
Half-crown =	2½	30	120
Florin =	2	24	96
Shilling =	1	12	48
Sixpence =	½	6	24
Threepence =	¼	3	12
Penny =	$\frac{1}{12}$	1	4
Halfpenny =	$\frac{1}{24}$	$\frac{1}{2}$	2
Farthing =	$\frac{1}{48}$	$\frac{1}{4}$	1

OTHER ENGLISH COINS (*now not in common use*).

A Groat ...	Fourpence.	A Mark ...	13s. 4d.
A Tester ...	Sixpence.	A Guinea ...	£1 1s.
A Noble ...	6s. 8d.	A Carolus ...	£1 3s.
An Angel ...	10s. 0d.	A Jacobus ...	£1 5s.
A Half-Guinea	10s. 6d.	A Moidore ...	£1 7s.

FARTHINGS TABLE.

	<i>d.</i>	<i>Far.</i>	<i>s.</i>	<i>d.</i>	<i>Far.</i>	<i>s.</i>	<i>d.</i>	<i>Far.</i>	<i>s.</i>	<i>d.</i>
1	=	$\frac{1}{4}$		27	=	$6\frac{3}{4}$		53	=	$1\frac{1}{4}$
2	=	$\frac{1}{2}$		28	=	7		54	=	$1\frac{1}{2}$
3	=	$\frac{3}{4}$		29	=	$7\frac{1}{4}$		55	=	$1\frac{3}{4}$
4	=	1		30	=	$7\frac{1}{2}$		56	=	2
5	=	$1\frac{1}{4}$		31	=	$7\frac{3}{4}$		57	=	$2\frac{1}{4}$
6	=	$1\frac{1}{2}$		32	=	8		58	=	$2\frac{1}{2}$
7	=	$1\frac{3}{4}$		33	=	$8\frac{1}{4}$		59	=	$2\frac{3}{4}$
8	=	2		34	=	$8\frac{1}{2}$		60	=	3
9	=	$2\frac{1}{4}$		35	=	$8\frac{3}{4}$		61	=	$3\frac{1}{4}$
10	=	$2\frac{1}{2}$		36	=	9		62	=	$3\frac{1}{2}$
11	=	$2\frac{3}{4}$		37	=	$9\frac{1}{4}$		63	=	$3\frac{3}{4}$
12	=	3		38	=	$9\frac{1}{2}$		64	=	4
13	=	$3\frac{1}{4}$		39	=	$9\frac{3}{4}$		65	=	$4\frac{1}{4}$
14	=	$3\frac{1}{2}$		40	=	10		66	=	$4\frac{1}{2}$
15	=	$3\frac{3}{4}$		41	=	$10\frac{1}{4}$		67	=	$4\frac{3}{4}$
16	=	4		42	=	$10\frac{1}{2}$		68	=	5
17	=	$4\frac{1}{4}$		43	=	$10\frac{3}{4}$		69	=	$5\frac{1}{4}$
18	=	$4\frac{1}{2}$		44	=	11		70	=	$5\frac{1}{2}$
19	=	$4\frac{3}{4}$		45	=	$11\frac{1}{4}$		71	=	$5\frac{3}{4}$
20	=	5		46	=	$11\frac{1}{2}$		72	=	6
21	=	$5\frac{1}{4}$		47	=	$11\frac{3}{4}$		73	=	$6\frac{1}{4}$
22	=	$5\frac{1}{2}$		48	=	1	0	74	=	$6\frac{1}{2}$
23	=	$5\frac{3}{4}$		49	=	1	$0\frac{1}{4}$	75	=	$6\frac{3}{4}$
24	=	6		50	=	1	$0\frac{1}{2}$	76	=	7
25	=	$6\frac{1}{4}$		51	=	1	$0\frac{3}{4}$	77	=	$7\frac{1}{4}$
26	=	$6\frac{1}{2}$		52	=	1	1	78	=	$7\frac{1}{2}$
								79	=	1
								80	=	1
								81	=	1
								82	=	1
								83	=	1
								84	=	1
								85	=	1
								86	=	1
								87	=	1
								88	=	1
								89	=	1
								90	=	1
								91	=	1
								92	=	1
								93	=	1
								94	=	1
								95	=	1
								96	=	2
								100	=	2
								104	=	2
								108	=	2
								112	=	2
								120	=	2
								240	=	5
								480	=	10
								960	=	£1 0 0

PENCE TABLE.

<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>d.</i>	£	<i>s.</i>	<i>d.</i>				
12	=	1	0	40	=	3	4	68	=	5	8	96	=	8	0	
13	=	1	1	41	=	3	5	69	=	5	9	97	=	8	1	
14	=	1	2	42	=	3	6	70	=	5	10	98	=	8	2	
15	=	1	3	43	=	3	7	71	=	5	11	99	=	8	3	
16	=	1	4	44	=	3	8	72	=	6	0	100	=	8	4	
17	=	1	5	45	=	3	9	73	=	6	1	140	=	11	8	
18	=	1	6	46	=	3	10	74	=	6	2	200	=	16	8	
19	=	1	7	47	=	3	11	75	=	6	3	240	=	1	0	0
20	=	1	8	48	=	4	0	76	=	6	4	300	=	1	5	0
21	=	1	9	49	=	4	1	77	=	6	5	400	=	1	13	4
22	=	1	10	50	=	4	2	78	=	6	6	480	=	2	0	0
23	=	1	11	51	=	4	3	79	=	6	7	500	=	2	1	8
24	=	2	0	52	=	4	4	80	=	6	8	600	=	2	10	0
25	=	2	1	53	=	4	5	81	=	6	9	700	=	2	18	4
26	=	2	2	54	=	4	6	82	=	6	10	720	=	3	0	0
27	=	2	3	55	=	4	7	83	=	6	11	800	=	3	6	8
28	=	2	4	56	=	4	8	84	=	7	0	900	=	3	15	0
29	=	2	5	57	=	4	9	85	=	7	1	960	=	4	0	0
30	=	2	6	58	=	4	10	86	=	7	2	1000	=	4	3	4
31	=	2	7	59	=	4	11	87	=	7	3	1100	=	4	11	8
32	=	2	8	60	=	5	0	88	=	7	4	1200	=	5	0	0
33	=	2	9	61	=	5	1	89	=	7	5	1300	=	5	8	4
34	=	2	10	62	=	5	2	90	=	7	6	1400	=	5	16	8
35	=	2	11	63	=	5	3	91	=	7	7	1440	=	6	0	0
36	=	3	0	64	=	5	4	92	=	7	8	1500	=	6	5	0
37	=	3	1	65	=	5	5	93	=	7	9	1600	=	6	13	4
38	=	3	2	66	=	5	6	94	=	7	10	1680	=	7	0	0
39	=	3	3	67	=	5	7	95	=	7	11	2000	=	8	6	8

CHRONOLOGICAL TABLE

Showing the most interesting events in history

	B.C.		A.D.
The Creation	4004	Union of crowns of England and Scotland	1603
Commencement of Chinese history	2700	Gunpowder Plot, 5th November	1605
The Deluge, or Noah's Flood	2348	The death of Wm. Shakespeare	1616
The Fall of Troy	1183	Charles I beheaded, 30th January	1649
Cæsar's invasion of Britain	59	Commonwealth declared, 19th May	1649
Cæsar murdered by conspirators	44	Oliver Cromwell made Lord Protector	1653
Jesus Christ born 4 years before Christian era	4	Restoration of Charles II... ..	1660
Christian era	A.D.	The Great Plague of London	1665
Claudius Cæsar's expedition to Britain	43	The Great Fire of London.. ..	1666
London becomes a Roman station	50	Revolution began 5th November	1688
Revolt of Britains under Boadicea	61	Land Tax enacted in England	1689
Pompeii and Herculaneum destroyed	79	Parliament elect William and Mary	1689
The Romans finally quitted Britain	410	Bank of England established	1694
England invaded by the Danes	653	Union of kingdoms of England and Scotland	1707
The Britons subdued by the Saxons	685	Canada taken from the French	1759
The Battle of Hastings	1066	Captain Cook landed in Botany Bay	1770
Tower of London built	1078	U.S.A. independence acknowledged	1782
The Crusades commenced... ..	1098	The first settlement in Australia	1788
Ireland conquered by Henry II	1171	The French Revolution begun	1789
Magna Charta signed by King John	1215	French Republic declared... ..	1792
First representative Parliament	1265	The Irish Rebellion	1798
Battle of Cressy; French beaten	1346	The Union of Great Britain and Ireland	1801
The Papal Authority abolished in England by Act of Parliament	1391	The Battle of Trafalgar	1805
Caxton brought printing to England	1471	The Battle of Waterloo, 18th June	1815
America discovered by Columbus	1492	Death of George III	1820
Reformation introduced into England	1534	George IV crowned, 19th July	1821
Mary, Queen of Scots, beheaded	1587	The Roman Catholic Relief Bill	1829
The Spanish Armada defeated	1588	Death of George IV	1830
		The first Reform Act passed	1832

ARITHMETICAL TABLE BOOK
CHRONOLOGICAL TABLE (continued)

18

	A.D.		A.D.
Slavery abolished by Parliament	1833	Great Railway and Dock Strikes	1911
English Poor Law Amendment Act	1834	Great War. 4th August, 1914, to 11th November	1918
Death of William IV	1837	Summer Time introduced, 21st May	1916
Queen Victoria crowned, 28th June	1838	League of Nations—1st meeting, 15th November	1920
Penny Post commenced, 10th January	1840	Broadcasting commenced, 14th November	1922
Hong Kong taken from Chinese	1841	First Labour Government, 22nd January	1924
Repeal of Corn Laws, 26th June	1846	General Strike, 8th May	1926
The first International Exhibition	1851	R101 Airship Disaster, 5th October	1930
Siege and Capture of Sebastopol	1855-6	National Government formed, 23rd August	1931
Indian Mutiny broke out....	1857	Death of George V, 20th January	1936
Death of Prince Consort	1861	Edward VIII abdicated, December	1936
The Second Reform Act passed	1867	Television commenced	1936
Suez Canal opened	1869	George VI crowned, 12th May	1937
Queen Victoria proclaimed Empress of India	1877	King and Queen visit Canada and U.S.A.	1939
English occupation of Egypt	1882	War declared on Germany, 3rd September....	1939
The Great London Dock Strike	1889	Battle of Britain, September	1940
Opening of the Tower Bridge and Manchester Ship Canal	1894	Normandy D. Day Landing, 6th June	1944
Dr. Jameson's raid in Transvaal	1896	War with Germany terminated, 8th May	1945
Boer War commenced, 11st October	1899	Death of President Roosevelt	1945
Death of Queen Victoria, 22nd January	1901	Atom Bomb attack on Hiroshima	1945
Boer War peace declared, 31st May	1902	Marriage of Princess Elizabeth, 20th November	1947
Edward VII crowned, 9th August	1902	Birth of Prince Charles, 14th November	1948
King and Queen of Servia assassinated	1903	Birth of Princess Anne, 15th August	1950
Russo-Japanese War	1904-5	Death of King George VI, 6th February	1952
Old Age Pensions first paid, 1st January	1909	Death of Queen Mary	1953
Edward VII died, 6th May..	1910	Coronation of Queen Elizabeth II, 2nd June....	1953
Revolution in Portugal, King deposed	1910	Royal Tour of Commonwealth, November, 1953	
George V crowned, 22nd June	1911	—May	1954

WEIGHTS AND MEASURES.

THE TABLES OF WEIGHTS AND MEASURES may be properly arranged under seven heads, agreeably to the Act of Uniformity, which took effect in January, 1826, viz:—1. LENGTH; 2. SURFACE; 3. VOLUME; 4. MEASURES OF WEIGHT; 5. CAPACITY; 6. SPACE; 7. TIME AND MOTION.

I.—LENGTH, OR LINEAL MEASURE.

LONG MEASURE.

12 inches	make 1 foot, <i>ft.</i>
3 feet	„ 1 yard, <i>yd.</i>
5½ yards	„ 1 rod, pole or perch.
40 poles (220 yards)	„ 1 furlong, <i>fur.</i>
8 furlongs (1,760 yards)	„ 1 mile, <i>ml.</i>

12 lines or 3 barleycorns	make 1 inch, <i>in.</i>
4 inches	„ 1 hand, <i>hd.</i>
9 inches	„ 1 span, <i>sp.</i>
18 inches (2 spans)	„ 1 cubit.
2½ feet	„ 1 pace (military)
5 feet	„ 1 pace (geometrical)
3 miles	„ 1 league, <i>lea.</i>
69·121 miles	„ (1 degree, °)

The hand is used for measuring horses. The span is seldom used except for rough measurements.

LAND MEASURE (LENGTH.)

7·92 inches	make 1 link.
12 inches, or 1·515 links	„ 1 foot.
36 inches, or 4·545 links	„ 1 yard.
25 links, or 198 inches	„ 1 pole or perch.
4 poles, or 100 links	„ 1 chain.
10 chains, or 1,000 links	„ 1 furlong.
8 furlongs, or 80 chains	„ 1 mile.

Land is measured by *Gunter's Chain*, which is 4 poles, or 22 yards in length, and is divided into 100 equal parts, called *links*. To every tenth link are attached pieces of brass for convenience in counting.

The length of a pole varies in different parts of England, being 6, 7, or 8 yards in various places, but the statute pole is 5½ yards.

NAUTICAL OR GEOGRAPHICAL MEASURE.

6 feet	...	...	...	make 1 fathom.
100 fathoms	...	...	..	1 cable's length.
1,013 $\frac{1}{2}$ fathoms, or 6,080 feet	...	...	..	1 knot, nautical or geographical mile.
3 knots	...	...	..	1 nautical league.
60 nautical miles	...	...	..	1 degree.
360 degrees	...	...	..	the earth's circumference.

A mile in different countries varies considerably as the following shows:—

The English statute mile contains	1,760 Yards.
The English nautical mile contains	2,026 $\frac{1}{2}$ "
The old Scotch mile contains	1,973 "
The Irish mile contains	2,240 "
The French mean league contains	3,666 "
The German meile contains	8,239 "
The Russian verst contains	1,167 "
The Spanish legua contains	4,036 "

CLOTH MEASURE.

2 $\frac{1}{4}$ inches	...	...	...	make 1 nail.
4 nails	...	...	..	1 quarter.
3 quarters	...	...	..	1 Flemish ell.
4 quarters, or 36 inches	...	...	..	1 yard.
5 quarters, or 45 inches	...	...	..	1 English ell.
6 quarters, or 54 inches	...	...	..	1 French ell.

Most materials are now sold by the yard, which is the same as Long Measure, but the divisions and sub-divisions—quarters and nails—are still used.

II.—MEASURES OF SURFACE.

SQUARE, SURFACE OR LAND MEASURE.

144 square inches (12×12)	.....	make 1 square foot, <i>sq. ft.</i>
9 square feet (3×3)	.....	.. 1 square yard, <i>sq. yd.</i>
30 $\frac{1}{2}$ square yards ($5\frac{1}{2} \times 5\frac{1}{2}$)	.....	.. 1 square rod, pole or perch.
40 square rods, poles or perches	.....	.. 1 rood, <i>rd.</i>
4 roods, or 4,840 sq. yds.	.....	.. 1 acre, <i>ac.</i>
640 acres	.....	.. 1 square mile, <i>sq. ml.</i>
625 square links (25×25)	.....	make 1 square rod, pole or perch.
10,000 square links (100×100) or 16 sq. poles	.....	.. 1 square chain.
10 square chains, or 100,000 sq. links	.....	.. 1 acre.
100 acres	.....	.. 1 hide of land.
40 hides	.....	.. 1 barony.

III.—MEASURES OF VOLUME.

CUBIC OR SOLID MEASURE.

1,728 cubic inches ($12 \times 12 \times 12$)	make 1 cubic foot.
27 cubic feet ($3 \times 3 \times 3$)	„ 1 cubic yard.

1 cubic yard of earth	= 1 load.
40 cubic feet of rough, or 50 cubic feet of hewn timber }	= 1 ton or load.
42 cubic feet of timber	= 1 ton of shipping.
108 cubic feet of timber	= 1 stack of wood.
128 cubic feet of timber	= 1 cord of wood.
35 cubic feet	= 1 ton of displacement of a ship
40 cubic feet	= 1 ton of shipped merchandise.

The dimensions of timber, stone, marble, excavations, and of all works which have length, breadth, and thickness, are taken by lineal measure; but the contents are calculated by cubic measure.

A cube is a solid body, and has length, breadth, and thickness. To find the solid contents of any body multiply the length by the breadth, and that again by the thickness. A cube number is found by multiplying the number twice by itself as $12 \times 12 \times 12 = 1728$.

IV.—MEASURES OF WEIGHT.

AVOIRDUPOIS WEIGHT.

The name Avoirdupois is derived from the French words *Avoir* (to have), *du* (some), *pois* (weight).

27·34375 troy grains	make 1 dram.
16 drams	„ 1 ounce, <i>oz.</i>
16 ounces	„ 1 pound, <i>lb.</i>
14 pounds	„ 1 stone.
28 pounds (2 stone)	„ 1 quarter, <i>qr.</i>
4 quarters (112 lbs.)	„ 1 hundredweight, <i>cwt.</i>
20 hundredweights (2,240 lbs)	„ 1 ton.

Avoirdupois weight is used in almost all commercial transactions and common dealings. A pound Avoirdupois consists of 7,000 grains, and a pound Troy of 5,760

TROY WEIGHT.

Troy weight has its name from Troyes, a town in France, and was introduced by William the Conqueror: by it are weighed gold, silver, jewels, amber, precious stones, electuaries, and all liquids.

4 grains	make 1 carat.*
24 grains (6 carats)	„ 1 pennyweight, <i>dwt.</i>
20 pennyweights (480 grains)	„ 1 ounce, <i>oz.</i>
12 ounces (5,760 grains)	„ 1 pound, <i>lb.</i>
25 pounds	„ 1 quarter, <i>qr.</i>
100 pounds (4 quarters)	„ 1 hundredweight, <i>cwt.</i>
20 hundredweights	„ 1 ton of gold or silver.

* The carat used for weighing diamonds is equal to 3.17 grains.

APOTHECARIES' WEIGHT.

20 grains..... = 1 Scruple \mathfrak{S}	8 drachms..... = 1 ounce \mathfrak{z}
3 scruples... = 1 drachm \mathfrak{d}	12 ounces = 1 pound <i>lb</i>

This weight is no longer official, but it is retained here, as it is not quite obsolete. Drugs are now bought and sold, and medicines compounded, by Avoirdupois weight.

APOTHECARIES' FLUID MEASURE.

60 minims (\mathfrak{m}).....	= 1 fluid drachm, \mathfrak{f} \mathfrak{z}
8 drachms	= 1 ounce, \mathfrak{f} \mathfrak{z}
20 ounces	= 1 pint, \mathcal{O}
8 pints	= 1 gallon (imperial) <i>cong.</i>

WOOL WEIGHT.

7 pounds	= 1 clove.	6½ tods (1cwt. 3st.)	= 1 wey.
2 cloves (14lbs.)	= 1 stone.	2 weys	= 1 sack.
2 stones (28lbs.)	= 1 tod.	12 sacks	= 1 last.

Although 28lb. of wool is, legally speaking, a tod, wool staplers and manufacturers in their transactions are accustomed to reckon 30lb. to the tod, and 8 tods or 240lb. to the Pack.

HAY AND STRAW WEIGHT.

36 pounds	make 1 truss of straw.
56 pounds	„ 1 truss of old hay.
60 pounds	„ 1 truss of new hay.
36 trusses	„ 1 load.

Hay is called old after the commencement of September. A load of old hay should weigh 18 cwt., and a load of new hay 19 cwt., 32 lbs. A load of straw weighs 11 cwt., 64 lb.

WHEATEN BREAD.

A Quartern Loaf*	...	...	weighs	4lb.	5 oz.	8½dr.
A Half-peck Loaf	...	...	"	8	11	1
A Peck Loaf	...	...	"	17	6	2
A Peck or Stone of Flour	...	...	"	14	0	0
A Bushel of Flour	...	...	"	56	0	0
A Sack of Flour (5 Bushels)	...	...	"	280	0	0

* Bread is now usually sold in 4-lb. and 2-lb. loaves, which, by law, must be weighed in the presence of the purchaser.

V.—MEASURES OF CAPACITY.

DRY MEASURE.

4 gills	...	make 1 pint.	2 bushels	make 1 strike.
2 pints	...	" 1 quart.	4 bushels	" 1 coomb.
2 quarts	...	" 1 pottle.	8 bushels	" 1 quarter.
4 quarts	...	" 1 gallon.	4 quarters	" 1 chaldron.
2 gallons	...	" 1 peck.	5 quarters	" 1 load.
4 pecks	...	" 1 bushel.	80 bushels	" 1 last.

By this measure are reckoned all kinds of grain, such as Barley, Wheat, Oats, Peas, etc. The bushel (imperial) consists of an upright cylinder with an internal diameter of 18.789 inches and a depth of 8 inches. It contains 2,218.192 cubic inches.

WINE AND SPIRIT MEASURE.

4 gills	= 1 pint.	42 gallons	= 1 tierce.
2 pints	= 1 quart.	63 gallons	= 1 hogshead.
4 quarts	= 1 gallon.	84 gallons	= 1 puncheon.
10 gallons	= 1 anker.	2 hogsheads (126 gals)	= 1 pipe or butt.
18 gallons	= 1 runlet.	2 pipes (252 gals.)	= 1 tun.

Practically, the only measures in use are gallons and quarts, the others are merely nominal. Of imported wines the following are the usual measurements:—

Pipe of Port or Masden	. . . . .	= 115 gallons.
Pipe of Teneriffe	. . . . .	= 100 gallons.
Pipe of Marsala	. . . . .	= 93 gallons.
Pipe of Madeira and Cape	. . . . .	= 92 gallons.
Pipe of Sherry and Trent	. . . . .	= 108 gallons.
Butt of Lisbon and Bucellas	. . . . .	= 117 gallons.
Aum of Hock and Rhenish	. . . . .	= 30 gallons.
Hogshead of Claret or Madeira	. . . . .	= 46 gallons.
Hogshead of Port	. . . . .	= 57 gallons.
Hogshead of Sherry	. . . . .	= 54 gallons.

ALE AND BEER MEASURE.

2 pints	= 1 quart.	2 kilderkins	= 1 barrel.
4 quarts	= 1 gallon.	1½ barrels	= 1 hogshead.
9 gallons	= 1 firkin.	3 barrels	= 1 butt.
2 firkins	= 1 kilderkin.	2 butts (216 gals.)	= 1 tun.

VI.—MEASURES OF SPACE.

CIRCULAR (OR ANGULAR) MEASURE.

60 seconds (")	...	...	make 1 minute, (')
60 minutes	...	...	„ 1 degree, (°)
30 degrees	...	...	„ 1 sign, (s.)
45 degrees	...	...	„ 1 octant.
60 degrees	...	...	„ 1 sextant.
90 degrees (a right angle)	...	...	„ 1 quadrant.
180 degrees (two right angles)	...	...	„ 1 semicircle.
360 degrees (twelve signs)	...	...	„ 1 circumference or circle.

The *circumference* of a circle is nearly $3\frac{1}{2}$ times its diameter, or, more accurately, 3.1416 times.

This table represents the division of a circle drawn round the circumference of the globe, and the greater part of it the division of any circle. It is used in trigonometrical, geographical, and astronomical calculations.

DIVISION OF A DEGREE, OR MEAN APPARENT MOTION OF THE SUN.

360 degrees	= 24 hours.	1 degree	= 4 minutes.
15 degrees	= 1 hour.	½ degree	= 1 minute.

VII.—MEASURES OF TIME AND MOTION.

60 seconds	.....	make 1 minute.
60 minutes	.....	„ 1 hour.
24 hours	.....	„ 1 day.
7 days	.....	„ 1 week.
4 weeks	.....	„ 1 lunar month.
28, 29, 30 or 31 days	.....	„ 1 calendar month.
12 calendar or 13 lunar months	.....	„ 1 year.
365 days	.....	„ 1 common year.
366 days	.....	„ 1 leap year.
365 days, 6 hours	.....	„ 1 Julian year.
100 years	.....	„ 1 century.

5 hours

48 min

46 sec

THE YEAR IS DIVIDED INTO 12 CALENDAR MONTHS.

<i>Name.</i>	<i>No. of days</i>	<i>Zodiacal Sign.</i>	<i>Symbol.</i>
January	31	Aquarius, or the Water-Bearer	♒
February	28*	Pisces, or the Fishes	♓
March ...	31	Aries, or the Ram ...	♈
April ...	30	Taurus, or the Bull	♉
May ...	31	Gemini, or the Twins	♊
June ...	30	Cancer, or the Crab	♋
July ...	31	Leo, or the Lion	♌
August ...	31	Virgo, or the Virgin	♍
September	30	Libra, or the Balance	♎
October ...	31	Scorpio, or the Scorpion	♏
November	30	Sagittarius, or the Archer	♐
December	31	Capricornus, or the Goat	♑

* In Leap Year February has 29 days.

HOW TO TELL LEAP YEAR.

In 400 years there are 97 Leap Years and 303 common years.

Leap year (consisting of 366 days) is found by dividing the year of our Lord (Anno Domini, or A.D.) by 4; if there is no remainder it is leap year; if otherwise, the remainder shows how many years it is after leap year. When, however, the number terminates a century, as 1500, 1800, the year has only 365 days, except when the *hundreds* are divisible by 4, as in 2000, 2400, 1600, where 20, 24, and 16 are divisible by 4.

HOW TO TELL THE NUMBER OF DAYS IN EACH MONTH.

The number of days in each month is thus recapitulated in an old rhyme:

"Thirty days hath September,
April, June, and November;
All the rest have thirty-one,
Excepting February alone,
Which has but twenty-eight days clear,
And twenty-nine in each leap year."

QUARTER DAYS.

ENGLAND AND IRELAND.

Lady Day 25th. March.
Midsummer 24th. June.
Michaelmas 29th. September.
Christmas 25th. December.

SCOTLAND.

Candlemas 2nd. February.
Whitsun 15th. May.
Lammas 1st. August.
Martinmas 11th. November.

THE SEASONS.

Spring commences ...	March 21	Autumn commences ...	Sept. 23
Summer commences ...	June 22	Winter commences ...	Dec. 23

Table of Measurement of a Degree of Longitude in various Latitudes.

<i>In Latitude.</i>	<i>Miles</i>	<i>In Latitude.</i>	<i>Miles</i>	<i>In Latitude.</i>	<i>Miles</i>
At Equator	69.1	40°	52.8	75°	18.0
10°	67.9	50°	44.3	80°	12.0
20°	64.8	60°	34.5	85°	6.0
30°	60.7	70°	23.6	90°	0.0

THE PLANETARY SYSTEM.

Sym- bol.	Name.	Mean Distance from Earth in Miles.	Mean Distance from Sun in Miles.	Time of Axial Rotation.	Mean Diameter in Miles.
☉	The Sun	92,900,000	—	H. M. 607 48	866,400
☿	Mercury	56,900,000	36,000,000	24 5½	3,030
♀	Venus ...	25,700,000	67,200,000	23 21½	7,700
♁	Earth ...	—	92,900,000	23 56	7,918
♂	Mars ...	48,600,000	141,500,000	24 37½	4,230
♃	Jupiter	390,400,000	483,300,000	9 56	86,500
♄	Saturn	793,200,000	886,100,000	10 14½	71,000
♅	Uranus	1,689,000,000	1,781,900,000	9 30	31,900
♆	Neptune	2,698,800,000	2,791,700,000	—	32,900

Besides these, there have now been discovered nearly three hundred small planets or "asteroids."

The distance of the nearest fixed star from the earth is 420,000 times the distance between the earth and the sun. Travelling at the rate of an express train—sixty miles an hour—it would take over 65 million years to travel this distance, and the light travelling from such a star at the enormous speed of 184,000 miles per second takes nearly seven years to reach the earth.

The **Velocity of Light** equals 184,000 miles per second.

The **Velocity of Sound** equals about 1,130 feet per second

THERMOMETERS.

The Thermometer is an instrument for measuring the temperature of any liquid, gas or substance. It consists of a glass tube, from which all the air has been exhausted, partially filled with mercury, spirits of wine, or other liquid. This either expands or shrinks respectively as heat or cold is applied to the outside of the tube. The shrinkage and expansion are invariable and equal, and can therefore be measured.

In the United Kingdom two thermometric scales are in use—the *Fahrenheit* and the *Centigrade*, the latter mainly for scientific purposes. On the Continent *Réaumur's* Scale is sometimes used.

One degree of temperature on a Centigrade scale is greater than a Fahrenheit degree in the ratio of 9 to 5; and one degree Réaumur is greater than a Centigrade degree in the ratio of 5 to 4. The scale indications of the freezing-point and the boiling-point of water is as follows:

			Fahr.	Cent.	Réaumur.
Freezing-point	...	...	32°	0°	0°
Boiling-point	...	...	212°	100°	80°

THE BAROMETER, ETC.

The Barometer is an instrument for measuring the pressure of the atmosphere. With its aid we are to some extent able to foretell changes in the weather. It is also of use to roughly gauge the height of mountains. As we ascend, the pressure of the atmosphere becomes less; the barometer consequently falls, and by the amount of its fall, taking into account the temperature, we can estimate the height above the sea-level.

Atmospheric Pressure equals 14.73 lb. per square inch at the sea-level, which is equal to the weight of a column of mercury 29.92 inches high.

One inch of Rainfall weighs 100 tons 9 cwt of water per acre. A ton of water contains 35.9 cubic feet.

ELECTRICAL MEASURES.

It is customary among electricians to express all measurements in terms of the centimeter, gramme, second (C.G.S.) system, either as force or work according to their nature, and, due allowance being made for the effect of gravitation, these units are called "absolute." To understand the basis of this system requires a great deal of careful study, and more space than we have at our disposal; but it is fair to mention that the accuracy aimed at has not, and probably never will be, attained. For practical and commercial purposes the chief units are:—

The Volt (the unit of electromotive force) = about 92.6% of that given by one Daniell's battery cell.

The Ohm (the unit of resistance) = the resistance offered to the passage of a current of electricity by a thread of mercury 106 cm. long and 1 mm. cross section, at the temperature of melting ice.

The Ampere (the unit of current) = the current 1 volt will drive through 1 ohm.

The Coulomb (the unit of quantity) = 1 ampere flowing for 1 second of time.

The Microfarad (the unit of capacity) = .000,001 coulomb at 1 volt pressure.

The Watt (the unit of power) = 44 ft. pounds per minute.

A Board of Trade Unit = 1,000 watts 1 hour.

746 watts = 1 horse-power.

One Board of Trade unit will keep a 16-candle incandescent lamp alight for about 16 hours.

DECIMALS.

In decimals a dot called the decimal point is placed next to the right of the unit of a number, and figures placed to the right of this dot represent tenths, hundredths, or thousandths, etc., of a unit, according to their place; those next the dot representing tenths of a unit, the next hundredths, and so on.

Thus $1.2 = 1 + \frac{2}{10}$; $1.23 = 1 + \frac{2}{10} + \frac{3}{100} = 1\frac{23}{100}$. The Decimal System is easy to calculate, and forms the basis of "The Metric System" of measures.

THE METRIC SYSTEM.

The Metric System is based upon the (assumed) length of the direct distance from the Equator to the North Pole. The ten-millionth part of this distance was chosen as the unit of measures of length, and called a *Mètre*. The cube of the tenth part of the metre was adopted as the unit of capacity, and denominated a *Litre*. The weight of a litre of distilled water at its greatest density was called a *Kilogramme*, of which a thousandth part, or *Gramme*, was adopted as the unit of weight. The multiples of these proceeding in decimal progression are distinguished by the employment of the prefixes *deca*, *hecto*, *kilo*, and *myria*, from the Greek, and the subdivisions by *deci*, *centi*, and *milli*, from the Latin.

I.—MEASURES OF LENGTH.

The unit, the Metre, as stated above, is the ten-millionth part of a meridian arc from the Pole to the Equator.

A Metre is equal to.....	39.3708 Inches.	0.0497 Chain.
	3.2809 Feet.	0.00497 Furlong.
	1.0936 Yards.	0.0006213 Mile.
	0.1988 Pole.	0.5468 Fathom.

Metric Terms.	Proportion to the							
	Metre			M.	Fur.	Yds.	Ft.	Inches.
Millimetre	=	$\frac{1}{1000}$	=	0	0	0	0	0.03937
Centimetre	=	$\frac{1}{100}$	=	0	0	0	0	0.39371
Decimetre	=	$\frac{1}{10}$	=	0	0	0	0	3.93708
METRE	=	1	=	0	0	1	0	3.37079
Decametre	=	10	=	0	0	10	2	9.7079
Hectometre	=	100	=	0	0	109	1	1.079
Kilometre	=	1000	=	0	4	213	1	10.79
Myriametre	=	10000	=	6	1	156	0	11.9

II.—MEASURES OF SURFACE.

The unit is the Are, which is a square decametre.

An Are is equal to..... { 1076·4299 Square Feet.
119·6033 Square Yards.
3·9639 Perches.
0·24711 Square Chain.
0·00884 Rood.
0·02471 Acre.

Metric Terms.		Proportion to the Are.		Ac.	Rd.	Pch.	S. Yd.	Sq. Ft
Centiare	=	$\frac{1}{100}$	=	0	0	0	1	1·7643
ARE	=	1	=	0	0	3	28	7·68
Hectare	=	100	=	2	1	3	11	5·1

III.—MEASURES OF SOLIDITY.

The unit is the Stere, which is a cubic Metre.

A Stere is equal to { 61,027·0515 Cubic Inches.
35·31658 Cubic Feet.
1·308021 Cubic Yard.

Metric Terms.		Proportion to the Stere.		Same in contents as a
Centistere	=	$\frac{1}{100}$	=	610·270515 cubic inches. Decalitre.
Decistere	=	$\frac{1}{10}$	=	3·531658 cubic feet. Hectolitre.
STERE	=	1	=	1·308021 cubic yards. Kilolitre.
Decastere	=	10	=	13·08021 cubic yards. Myrialitre.

IV.—MEASURES OF CAPACITY.

The unit is the Litre, which is a cubic decimetre.

A Litre is equal to..... { 61·02705 Cubic Inches.
1·76077 Imperial Pint.
0·22009 Imperial Gallon.
0·02751 Imperial Bushell.

Metric Terms.		Proportion to the Litre.		Cubic In.		Gals.	Qts.	Pints.
Millilitre	=	$\frac{1}{1000}$	=	0·06103	=	0	0	0·00176077
Centilitre	=	$\frac{1}{100}$	=	0·61027	=	0	0	0·0176077
Decilitre	=	$\frac{1}{10}$	=	6·10271	=	0	0	0·176077
LITRE	=	1	=	61·02705	=	0	0	1·76077
Decalitre	=	10	=	610·27051	=	2	0	1·6077
Hectolitre	=	100	=	6102·70515	=	22	0	0·077
Kilolitre	=	1000	=	61027·0515	=	220	0	0·77
Myrialitre	=	10000	=	610270·515	=	2200	3	1·7

V.—MEASURES OF WEIGHT.

The unit is the Gramme (or "Gram," Metric Act), which is the weight of a cubic centimetre of water.

A Gram is equal to.....
 { 15.43235 Grains. 0.0022 Avoir. Lba.
 0.03125 Troy Oz. 0.0000196 Cwt.
 0.03527 Avoir. Oz. 0.0000009 Ton.
 0.00267 Troy Lb.

Metric Terms.	Proportion to the Gram.		Troy.			Avoirdupois.		
			Lb.	Oz.	Dwt. Gr.	Cwt. Q.	Lb. Oz.	Dram.
Milligram	$\frac{1}{1000}$	=	0	0	0 0.0154	0 0	0 0	0.00056438
Centigram	$\frac{1}{100}$	=	0	0	0 0.1543	0 0	0 0	0.0056438
Decigram	$\frac{1}{10}$	=	0	0	0 1.5432	0 0	0 0	0.056438
GRAM	1	=	0	0	0 15.4323	0 0	0 0	0.56438
Decagram	10	=	0	0	6 10.3234	0 0	0 0	5.6438
Hectogram	100	=	0	3	4 7.2347	0 0	0 3	8.4383
Kilogram	1000	=	2	8	3 0.347	0 0	2 3	4.383
Myriagram	10000	=	26	9	10 3.47	0 0	22 0	11.8304
Quintal	100000	=	267	11	1 10.7	1 3	24 7	6.304
Millier	1000000	=	2679	2	14 12	19 2	20 9	15.04

SUGGESTED ENGLISH COINAGE.

10 Mills.....make 1 Cent.
 10 Cents „ 1 Florin.
 10 Florin „ 1 Pound sterling (£)

INVOLUTION.						Vulgar & Decimal Fractions.	
Square of		Square of		Cube of			
2 is 4	13 is 169	1 is 1				$\frac{1}{2} = .5$	$\frac{1}{2} = .5$
3 ... 9	14 ... 196	2 ... 8				$\frac{1}{4} = .25$	$\frac{1}{4} = .25$
4 ... 16	15 ... 225	3 ... 27				$\frac{3}{4} = .75$	$\frac{3}{4} = .75$
5 ... 25	16 ... 256	4 ... 64				$\frac{1}{8} = .125$	$\frac{1}{8} = .125$
6 ... 36	17 ... 289	5 ... 125				$\frac{3}{8} = .375$	$\frac{3}{8} = .375$
7 ... 49	18 ... 324	6 ... 216				$\frac{5}{8} = .625$	$\frac{5}{8} = .625$
8 ... 64	19 ... 361	7 ... 343				$\frac{7}{8} = .875$	$\frac{7}{8} = .875$
9 ... 81	20 ... 400	8 ... 512				$\frac{1}{16} = .0625$	$\frac{1}{16} = .0625$
10 ... 100	30 ... 900	9 ... 729				$\frac{1}{8} = .125$	$\frac{1}{8} = .125$
11 ... 121	40 ... 1,600	10 ... 1,000				$\frac{3}{16} = .1875$	$\frac{3}{16} = .1875$
12 ... 144	50 ... 2,500	11 ... 1,331				$\frac{5}{16} = .3125$	$\frac{5}{16} = .3125$
						$\frac{7}{16} = .4375$	$\frac{7}{16} = .4375$
						$\frac{9}{16} = .5625$	$\frac{9}{16} = .5625$
						$\frac{11}{16} = .6875$	$\frac{11}{16} = .6875$
						$\frac{13}{16} = .8125$	$\frac{13}{16} = .8125$
						$\frac{15}{16} = .9375$	$\frac{15}{16} = .9375$

Reverse these for Square and Cube Roots.

MENTAL ARITHMETIC AIDS.

To Multiply by	5.—Add a cypher and divide by 2.
" "	25.— " 2 cyphers " 4.
" "	50.— " 2 " " 2.
" "	250.— " 3 " " 4.
" "	500.— " 3 " " 2.
" "	99.— " 2 " and from the total take away

the original number.

To Multiply by 999.—Add 3 cyphers, and from the total take away the original number.

To Divide by 5.—Multiply by 2 and place a decimal point (·) before last figure.
" " 25.— " 4 " " " 2 figures.
" " 125.— " 8 " " " 3 "
" " 10.—Put a decimal point before the last figure.
" " 100.— " " " 2 figures.
" " 1000.— " " " 3 figures.

A Number is exactly divisible

By 2 if the last figure is an even number.

By 3 if the sum of the figures is exactly divisible by 3.

By 4 if the number formed by the last two figures is exactly divisible by 4.

By 5 if the last figure is a 5 or a cypher.

By 8 if the number formed by the last three figures is exactly divisible by 8.

By 9 if the sum of the figures is divisible by 9.

By 24 if the last two figures are cyphers, or exactly divisible by 25.

To find Simple Interest at 5 per cent., call the pounds shillings, and fractions of a pound fractions of a shilling.

To find the Cost of

1 dozen Articles.—Call every penny in the price a shilling, every halfpenny sixpence, and every farthing threepence.

1 gross Articles.—Find the price per dozen, and then multiply this by 12; or for each penny in the price take 12s., and for each farthing 3s.

1 Score.—Call every shilling in the price a pound, and every penny 1s. 8d., or every threepence 6s.

48 Articles.—Call every farthing in the price a shilling.

100 Articles.—For every farthing in the price take as many pence and twice as many shillings.

240 Articles.—Call every penny in the price a pound.

480 Articles.—Call every halfpenny in the price a pound.

Commercial Numbers.

12 Articles 1 Dozen.	5 Score 1 Common Hundred.
18 Articles 1 Long Dozen.	6 Score 1 Great Hundred.
12 Dozen (144 Articles) 1 Gross.	80 Deals 1 Quarter.
168 Articles 1 Long Gross.	4 Quarters 1 Hundred.
20 Articles 1 Score.	

PRACTICE TABLES.

Aliquot Parts of a Pound.

s.	d.	
10	0	1-half
6	8	1-3rd.
5	0	1-4th.
4	0	1-5th.
3	4	1-6th.
2	6	1-8th.
2	0	1-10th.
1	8	1-12th.
1	4	1-15th.
1	3	1-16th.
1	0	1-20th.
0	8	1-30th.
0	6	1-40th.
0	4	1-60th.
0	3	1-80th.
0	2	1-120th.
0	1	1-240th.
0	0½	1-480th.
0	0¼	1-960th.

Of a Shilling.

6d.	1-half.
4	1-3rd.
3	1-4th.
2	1-6th.
1½	1-8th.
1	1-12th.
0¾	1-16th.
0½	1-24th.
0¼	1-48th.

Of a Penny.

¾d.	3-4th.
½	1-half.
¼	1-4th.

Of a Ton.

10cwt. 0 grs.	1-half.
5 0	1-4th.
4 0	1-5th.
2 2	1-8th.
2 0	1-10th.
1 1	1-16th.
1 0	1-20th.

Of a Cwt.

2grs. 0 lb.	1-half.
1 0	1-4th.
0 16	1-7th.
0 14	1-8th.
0 8	1-14th.
0 7	1-16th.
0 4	1-28th.

Of a Quarter.

14 lbs.	1-half.
7	1-4th.
4	1-7th.
3½	1-8th.
2	1-14th.
1	1-28th.

Of a Pound (Avoirdupois.)

8 ozs.	1-half.
4	1-4th.
2	1-8th.
1	1-16th.

Of an Acre.

2 r. 0 p	1-half.
1 0	1-4th.
0 20	1-8th.
0 10	1-16th.

OF A POUND TROY, or 12 ounces: the same as in parts of a Shilling, only call the Pence Ounces.

CUSTOMARY WEIGHTS AND MEASURES USED IN
BUYING AND SELLING THE FOLLOWING
COMMODITIES:—

Anchovies—barrel	...	...	...	...	30 lb.
Ashes (American)—cask	...	...	...	...	8½ to 5 cwt.
" (St. Petersburg)—cask	...	...	...	...	10 cwt.
Beef (Irish)—tierce of 38 pieces	...	...	...	...	304 lb.
Brandy—hoghead	...	...	...	...	45 to 60 imp. gals.
" —punchoon	...	...	...	...	100 to 110 imp. gals.
" —¼ cask	...	...	...	...	20 to 25 imp. gals.
Bricks—load	...	...	...	...	500 in number.
Bullion—bar	...	...	...	...	15 to 20 lb.
Butcher's Meat—stone	...	...	...	...	8 lb.
Butter	...	...	...	...	firkin, 56 lb.; tub 84 lb.; barrel, 224 lb.
Calico—piece	...	...	...	...	28 yards.
Camphor—box	...	...	...	...	about 1 cwt.
Candles—barrel	...	...	...	...	120 lb.
Cheese	...	...	...	...	stone, 16 lb.; weight 256 lb.
Cider—pipe	...	...	...	...	110 to 118 imp. gals.
Coals—ton (10 sacks of 2 cwt.)	...	...	...	...	20 cwt.
" (Newcastle)—chaldron of 3 wains	...	...	...	...	52½ cwt.
" " estimated for boats at	...	...	...	...	58 cwt.
Cocoa	...	...	...	...	bag, about 1 cwt.; cask, 1½ cwt.
Coffee—tierce 5 to 7 cwt.; barrel 1 to 1½ cwt.; bag 1½ to 1¾ cwt.; Mocha Bale 2 to 2½ cwt.	...	...	...	...
Corn—last	...	...	...	...	80 bushels.
Cotton-wool—bale (variable) American, average 477 lb.; Egyptian, 700 to 740 lb.; East India, 820 to 860 lb.; Brazilian, average 300 lb.	...	...	...	...
Currants—butt	...	...	...	...	15 to 20 cwt.
Figs—barrel	...	...	...	...	96 lb. to 2½ cwt.
Flour—barrel 196 lb.; peck or stone 14 lb.; boll of 10 pecks 140 lb.; sack of 2 bolls 280 lb.	...	...	...	...
Glass—seam	...	...	...	...	120 lb.
Gloves—dicker	...	...	...	...	10 dozen pair.
Gunpowder—barrel	...	...	...	...	100 lb.
Hemp—stone	...	...	...	...	32 lb.
Hides	...	...	...	...	dicker, 10 skins; last, 20 dickers.
Herrings (red)	...	...	...	...	cade, 500; barrel, 26½ gals.; cran, 37½ gals.
Hops	...	...	...	...	pocket, 1½ to 2 cwt.; bag, nearly 2½ cwt.
Lead—fodder or fodder	...	...	...	...	19½ cwt. or 2,184 lbs.
Linen (Irish)—piece	...	...	...	...	25 yards.
Molasses—punchoon	...	...	...	...	10 to 12 cwt.
Mustard—cask	...	...	...	...	8 to 18 lb.
Nutmegs—cask	...	...	...	...	200 lb.
Oil—tun	...	...	...	...	252 wine gals.; 210 imp. gals.
Olive Oil—chest of 60 flasks	...	...	...	...	125 imp. gals.
" —jar	...	...	...	...	25 imp. gals.
Opium (East India)—chest, 2 maunds	...	...	...	...	149½ lb.
" (Turkey)	...	...	...	...	136 lb.
Paper	...	...	...	...	quire, 24 sheets; ream (20 quires) 480 sheets.
Pepper (black)—Company's bag	...	...	...	...	316 lb.
" free-trade bags	...	...	...	...	28, 56, 112 lb.
" (white)—bag	...	...	...	...	1½ cwt.

CUSTOMARY WEIGHTS & MEASURES (*continued*).

Parchment—roll	...	...	...	...	60 skins.
Pilchards—hogshead (about 3,000 fish)	...	...	...	...	40 gals.
Plums	...	...	...	$\frac{1}{4}$ box, 20 lb.; carton, 9 lb.	...
Pork (Irish)—tierce, 80 pieces, or	...	...	...	...	320 lb.
Pot Ashes—barrel	...	...	...	...	200 lb.
Potatoes	...	...	...	bag, 112 and 168 lb.; 4 and 5 bushels.	...
Prunes—puncheon	...	...	...	...	10 to 12 cwt.
Quicksilver—bottle	...	...	...	...	about 84 lb.
Raisins (Valencia)—box, from about 30 to 40 lb.;	...	...	...	drum about 24 lb.; barrel 1 cwt.	...
Rice (East Indian)—bag	...	...	...	...	about $1\frac{1}{2}$ cwt.
„ (American)—cask	...	...	...	...	6 cwt.
Rum—puncheon	...	...	...	...	80 to 100 gals.
„ —hogshead	...	...	...	...	45 to 50 gals.
Sago	...	...	...	chest, $1\frac{1}{2}$ cwt.; bag, 1 cwt.	...
Salt	...	...	...	peck, 14 lb.; bushel, 56 lb.	...
Saltpetre (East Indian)—bag	...	...	...	...	$1\frac{1}{2}$ cwt.
Shellac—chest	...	...	...	...	1 to 3 cwt.
Soap	...	...	...	firkin, 64 lb.; barrel, 256 lb.	...
Soda—cask	...	...	...	...	3 to 4 cwt.
Sprats—cask	...	...	...	...	1,000 in number.
Steel—faggot	...	...	...	...	120 lb.
Straw	...	...	...	truss, 36 lb.; load, 1,296 lb.	...
Sugar (West India)—hogshead	...	...	...	...	13 to 16 cwt.
„ tierce	...	...	...	...	7 to 9 cwt.
„ (Mauritius)—matt or bag	...	...	...	...	1 to $1\frac{1}{2}$ cwt.
„ (East India)—bag	...	...	...	...	1 to $1\frac{1}{2}$ cwt.
Tallow—cask	...	...	...	...	about 9 cwt.
Tapica—barrel	...	...	...	...	about $1\frac{1}{2}$ cwt.
Tar—barrel	...	...	...	...	26 $\frac{1}{2}$ imp. gals.
Tea (Congo)—chest	...	...	...	...	about 80 lb.
„ (Hyson) „	...	...	...	...	60 to 80 lb.
„ ordinary chest	...	...	...	...	84 lb.
Tiles—load	...	...	...	...	1,000 in number.
Timber—load	...	...	...	...	40 cubic feet.
Tobacco—hogshead	...	...	...	...	12 to 18 cwt.
Turpentine—barrel	...	...	...	...	2 to $2\frac{1}{2}$ cwt.
Whiskey (Scotch)—puncheon	...	...	...	...	112 to 120 imp. gals.
„ hogshead	...	...	...	...	55 to 60 imp. gals.
Wire—stone	...	...	...	...	8 lb.

Diamonds are weighed by carats, 151 $\frac{1}{2}$ of which make 1 ounce Troy.

Oranges, lemons, corks, and a few other articles are often sold by the gross; nails, tacks, etc., have six score to the hundred.

A solid yard of well-wrought clay will make 460 bricks. 32 common bricks will cover a square yard. A common brick must not be more than 9 inches long, 4 $\frac{1}{2}$ inches wide and 2 $\frac{1}{2}$ inches thick.

Plain tiles should be 10 $\frac{1}{2}$ inches long, 6 $\frac{1}{2}$ inches wide, and $\frac{3}{4}$ inch thick.

Sheet lead is from 6 lb. to 10 lb. per square foot. A pipe of an inch bore is commonly 13 lb. or 14 lb. to the yard in length.

An imperial gallon of whale or seal oil should weigh 9 lb., of sperm oil 8 lb. 10 oz.

The log-line formerly used was about 450 feet long, having usually eight separate distances, of one knot each, or 48 feet, marked thereon. Patent logs are now used.

ARITHMETICAL TABLE BOOK

KINGS AND QUEENS OF ENGLAND

Name of Sovereign		Reign began	Y'rs R'g'd
Saxons and Danes			
Egbert	First King of all England	827	12
Ethelwulf	Son of Egbert	839	19
1 Ethelbald	Son of Ethelwulf	858)	2
1 Ethelbert	Second Son of Ethelwulf	858)	8
Ethelred	Third Son of Ethelwulf	866	5
Alfred	Fourth Son of Ethelwulf	871	30
Edward the Elder	Son of Alfred	901	24
Athelstan	Eldest Son of Edward	925	15
Edmund	Brother of Athelstan	940	6
Edred	Brother of Edmund	946	9
Edwy	Son of Edmund	955	3
Edgar	Second Son of Edmund	958	17
Edward the Martyr	Son of Edgar	975	4
Ethelred II	Half-Brother of Edward	979	37
Edmund Ironside	Eldest Son of Ethelred	1016	—
Canute	By conquest and election	1017	18
Harold I	Son of Canute	1035	5
Hardicanute	Another Son of Canute	1040	2
Edward the Confessor ..	Son of Ethelred II	1042	24
Harold II	Brother-in-law of Edward	1066	—
The House of Normandy			
William I	Obtained the Crown by conquest	1066	21
William II	Third Son of William I	1087	13
Henry I	Youngest Son of William I	1100	35
Stephen	Third Son of Stephen, Count of Blois, by Adela, fourth Daughter of William I	1135	19
The House of Plantagenet			
Henry II	Son of Geoffrey Plantagenet, by Matilda, only Daughter of Henry I ..	1154	35
Richard I	Eldest surviving Son of Henry II	1189	10
John	Sixth and youngest Son of Henry II ..	1199	17
Henry III	Eldest Son of John	1216	56
Edward I	Eldest Son of Henry III	1272	35
Edward II	Eldest surviving Son of Edward I	1307	20
Edward III	Eldest Son of Edward II	1327	50
Richard II	Son of the Black Prince, Eldest Son of Edward III	1377	22
The House of Lancaster			
Henry IV	Son of John of Gaunt, fourth son of Edward III	1399	13
Henry V	Eldest Son of Henry IV	1413	9
Henry VI	Only Son of Henry V	1422	39

KINGS AND QUEENS OF ENGLAND (continued)

Name of Sovereign		Reign began	Y'rs R'g'd
The House of York			
Edward IV	His grandfather was Richard, Son of Edmund, fifth son of Edward III..	1461	22
Edward V	Eldest Son of Edward IV	1483	—
Richard III	Younger brother of Edward IV	1483	2
The House of Tudor			
Henry VII	Son of Edmund, eldest Son of Owen Tudor by Katherine, widow of Henry V	1485	24
Henry VIII	Only surviving Son of Henry VII	1509	38
Edward VI	Son of Henry VIII, by Jane Seymour	1547	6
Mary I	Daughter of Henry VIII, by Kat. of Aragan	1553	5
Elizabeth I	Daughter of Henry VIII, by Anne Boleyn	1558	44
The House of Stuart			
James I (VI of Scotland)	Son of Mary Queen of Scots, grand- dau. of James IV and Margaret, daughter of Henry VII	1603	22
Charles I	Only surviving Son of James I	1625	24
The Commonwealth			
	Commonwealth declared May 19th..	1649	—
	Oliver Cromwell, Lord Protector	1653	—
	Richard Cromwell, Lord Protector...	1658	—
The House of Stuart—Restored			
Charles II	Eldest Son of Charles I	1660	25
James II	Second Son of Charles I	1685	3
William III	Son of William, Prince of Orange, and by Mary, daughter of Charles I	1689	13
Mary II	Eldest Daughter of James II		6
Anne	Second Daughter of James II	1702	12
The House of Hanover			
George I	Son of Elector of Hanover, by Sophia, dau. of Elizabeth, dau. of James I	1714	13
George II	Only Son of George I	1727	33
George III	Grandson of George II	1760	59
George IV	Eldest Son of George III	1820	10
William IV	Third Son of George III	1830	7
Victoria	Daughter of Edward, fourth son of George III	1837	63
The House of Saxe-Coburg			
Edward VII	Eldest Son of Victoria and Albert of Saxe-Coburg	1901	9
The House of Windsor			
George V	Surviving Son of Edward VII	1910	25
Edward VIII	Eldest Son of George V	1936	—
George VI	Second Son of George V	1936	16
Elizabeth II	Eldest Daughter of George VI	1952	—

CAPITAL CITIES OF THE PRINCIPAL COUNTRIES. OF THE WORLD

Country	Capital	Country	Capital
Abyssinia	Addis Ababa	Liechtenstein	Vaduz
Afghanistan	Kabul	Lebanon	Beirut
Albania	Tirana	Liberia	Monrovia
Argentina	Buenos Aires	Luxembourg	Luxembourg
Algeria	Algiers	Madagascar	Antananarivo
Australia	Canberra	Malaya	Kuala Lumpur
Austria	Vienna	Manchukuo	Changchun
Belgium	Brussels	Mexico	Mexico City
Belgian Congo	Leopoldville	Mongolia (Outer)	Urga
Bhutan	Punakha	Morocco	Marrakesh
Bolivia	La Paz	New Zealand	Wellington
Brazil	Rio de Janeiro	Netherlands	The Hague
Bulgaria	Sofia	Nepal	Khatmandu
Burma	Rangoon	Nicaragua	Managua
Canada	Ottawa	Nigeria	Lagos
Ceylon	Colombo	Northern Ireland	Belfast
Chile	Santiago	N. Rhodesia	Lusaka
China	Peiping	Norway	Oslo
Colombia	Bogota	Pakistan	Karachi
Costa Rica	San Jose	Panama	Panama City
Cuba	Havana	Paraguay	Asuncion
Czechoslovakia	Prague	Persia	Teheran
Denmark	Copenhagen	Peru	Lima
Dominican Rep.	Ciudad Trujillo	Phillipine Islands	Manila
Ecuador	Quito	Poland	Warsaw
Egypt	Cairo	Portugal	Lisbon
Eire	Dublin	Puerto Rico	San Juan
Finland	Helsinki	Rumania	Bucharest
France	Paris	El Salvador	San Salvador
Germany (E.)	Berlin	Saudi Arabia	Riyadh
Germany (W.)	Bonn	Scotland	Edinburgh
Gold Coast	Accra	Siam	Bangkok
Great Britain	London	Sierra Leone	Freetown
Greece	Athens	South Africa	Pretoria
Guatemala	Guatemala City		and Capetown
Haiti	Port au Prince	S. Rhodesia	Salisbury
Honduras	Tegucigalpa	Spain	Madrid
Hungary	Budapest	Sweden	Stockholm
Iceland	Reykjavik	Switzerland	Berne
India	New Delhi	Syria	Damascus
Indonesia	Djakarta	Tanganyika	Dar-es-Salaam
Iraq	Baghdad	Tibet	Lhasa
Israel	Jerusalem	Tunisia	Tunis
Italy	Rome	Turkey	Ankara
Jamaica	Kingston	United States	Washington
Japan	Tokio	Uruguay	Monte Video
Jordan	Amman	U.S.S.R.	Moscow
Kenya	Nairobi	Venezuela	Caracas
Korea	Seoul	Yugoslavia	Belgrade

ARITHMETICAL TABLE BOOK

COMPARISON OF TIME.

Difference in time is reckoned by the distance in degrees of longitude. The earth takes 24 hours to rotate 360 degrees or 15 degrees in one hour, or 1 degree in 4 minutes. Places which are 2 degrees apart will differ 8 minutes in time; 5 degrees will differ 20 minutes, and so on. Those lying EAST will be LATER in time and those WEST will be EARLIER.

THE APPENDED TABLE SHOWS THE HOUR IN VARIOUS PARTS OF THE WORLD WHEN IT IS NOON IN LONDON.

	H.	M.		H.	M.
Adelaide	9	14 p.m.	Mauritius	8	48 p.m.
Algiers	0	12 p.m.	Melbourne, Australia...	9	40 p.m.
Amsterdam	0	20 p.m.	Moscow	2	30 p.m.
Athens	1	35 p.m.	Munich	0	46 p.m.
Auckland, N.Z.	11	39 p.m.	St. John's, Newf'ndl'd	8	29 a.m.
Berlin	0	54 p.m.	New York	7	4 a.m.
Berne	0	30 p.m.	Paris	0	9 p.m.
Bombay	4	52 p.m.	Pekin	7	46 p.m.
Boston, U.S.	7	16 a.m.	Penzance	11	37 a.m.
Brindisi	1	12 p.m.	Perth, West Australia	7	43 p.m.
Brisbane	10	12 p.m.	Philadelphia	6	59 a.m.
Brussels	0	17 p.m.	Port Moresby, N. Guinea	10	4 p.m.
Calcutta	5	53 p.m.	Prague	0	58 p.m.
Cape of Good Hope ..	1	14 p.m.	Quebec	7	15 a.m.
Cape Horn	7	32 a.m.	Rome	0	50 p.m.
Chicago	8	10 a.m.	Rio de Janeiro	9	7 a.m.
Christiania	0	42 p.m.	Rotterdam ..	0	18 p.m.
Constantinople	1	56 p.m.	San Francisco	8	52 a.m.
Copenhagen	0	50 p.m.	St. Petersburg	2	1 p.m.
Dublin	11	35 a.m.	Shanghai	8	0 p.m.
Edinburgh	11	47 a.m.	Smyrna	1	48 p.m.
Florence	0	45 p.m.	Stockholm	1	12 p.m.
Glasgow	11	43 a.m.	Stuttgart	0	37 p.m.
Hamburg	0	40 p.m.	Suez	2	10 p.m.
Hobart, Tasmania	9	49 p.m.	Sydney	10	5 p.m.
Jerusalem	2	21 p.m.	Tahiti	2	3 a.m.
Leipzig	0	50 p.m.	Toronto	6	42 a.m.
Lisbon	11	23 a.m.	Vancouver	3	38 a.m.
Madras	5	21 p.m.	Vienna	1	5 p.m.
Madrid	11	45 a.m.	Warsaw	1	24 p.m.
Malta	0	58 p.m.	Washington	6	51 a.m.

ABBREVIATIONS USED IN WRITING AND PRINTING.

A.L.—First-class.	F.R.S.—Fellow of the Royal Society.	Mr.—Master, or Mister.
A.B.—Able-bodied seaman.	F.S.A.—Fellow of the Society of Antiquaries.	Mrs.—Mistress.
A.D.—(Lat. <i>Anno Domini</i>) In the year of our Lord.	GALL.—Gallon.	MS.—Manuscript.
Ad. Lrs.—At pleasure.	Gen.—General.	MSS.—Manuscripts.
A.M.—(Lat. <i>Ante Meridiem</i>) Before noon.	Gov.—Governor.	N.—North.
ANON.—Anonymous.	G.P.O.—General Post Office.	N.B.—(Lat. <i>Nota Bene</i> .) Note well; take notice.
B.A.—Bachelor of Arts.	Gr.—Grains, or gross.	Nm. con.—No one contradicting; unanimously.
BART.—Baronet.	H.M.S.—His or Her Majesty's Ship or Service.	Nat.—Without reduction.
B.C.—Before Christ.	Hon.—Honourable.	No. (Lat. <i>Numero</i>) Number
B.D.—Bachelor of Divinity.	H.R.H.—His or Her Royal Highness.	N.S.—New style (since 1752)
B/L.—Bill of Lading.	Is., <i>Idem</i> .—In the same place	O.H.M.S.—On His Majesty's Service.
Br.—Bishop.	Id.—(Lat. <i>Idem</i>) The same	O.S.—Old Style.
B.Sc.—Bachelor of Science.	i.e.—(Lat. <i>Id est</i>) That is.	Oz.—Ounce or ounces.
CAPT.—Captain.	L.H.S.—(Lat. <i>Jesus, or Jesus Hominum Salvator</i>) Jesus the Saviour of Men.	PAR. or ¶.—Paragraph.
C.B.—Companion of the Bath.	Imp.—Imperial.	Pas Cent.—By the Hundred
C.C.C.—Corpus Christi College.	I.N.R.I.—Jesus of Nazareth, King of the Jews.	P.M.—(Lat. <i>Post Meridiem</i>) Afternoon.
CENT.—A hundred.	Inst.—Instant (in the present month.)	P.O.O.—Post Office Order.
C.I.F.—Cost, Insurance, & Freight.	L.O.U.—An acknowledgment for money advanced	PROF.—Professor.
c/o—Care of.	J.P.—Justice of the Peace.	Pro. TEM.—For the time being. (Lat. <i>Pro Tempore</i>)
Co.—Company.	Jr., JUN. or JUNA.—Junior	PROX.—(Lat. <i>Proximo</i> .) Next month.
C.O.D.—Cash on delivery.	K.G.—Knight of the Garter.	P.S.—Postscript.
COL.—Colonel.	Knt. or Kt.—Knight.	P.T.O.—Please turn over.
CR.—Credit, Creditor.	L. or £.—A pound sterling.	Q.E.D.—(Lat. <i>Quod erat demonstrandum</i> .) Which was to be demonstrated.
Cwt.—A hundred weight.	LAT.—Latitude or Latin.	R.A.—Royal Academician.
D.C.L.—Doctor of Civil Law.	lb.—A pound in weight.	Rev.—Reverend.
D.D.—Doctor of Divinity.	Lieut. or Lt.—Lieutenant.	R.N.—Royal Navy.
Der.—Deputy; department.	LL.D.—Doctor of Laws.	R.S.V.P.—(Fr. <i>Répondez s'il vous plait</i> .) Answer, if you please.
Do. (<i>Diritto</i>)—The same.	LONG.—Longitude.	S.—South.
Doz.—Dozen.	L.S.D.—(Lat. <i>Libra, Solidi, Denarii</i> .) Pounds, Shillings, Pence.	St. or S.—Saint.
Dr.—Debtor; Doctor.	M.A.—Master of Arts.	STKT.—(Lat.) Let it stand.
D.V.—God willing.	MAD. or MME.—Madame.	U.K.—United Kingdom.
E.—East; Earl; Eastern.	MATH.—Mathematics.	Ult.—(Lat. <i>Ultimo</i> .) Last, or of the last month.
E. and O. E.—Errors and omissions excepted.	M.D.—Doctor of Medicine.	U.S.—United States.
e.g.—For example.	MDLLE., MLLLE.—Mademoiselle.	V.—(Lat. <i>Versus</i>) Against.
ESQR.—Engineer.	Mmeus, or MM.—(Fr. <i>Messieurs</i> .) Gentlemen; Sirs.	Via.—By way of.
ESQ.—Esquire.	Mons., M.—Monsieur; Sir.	Viz. (Lat. <i>videlicet</i>) namely
ETC. or &c.—And so forth.	M.P.—Member of Parliament.	W.—West.
EX.—Example.		XMAS.—Christmas.
EXOR.—Executor.		Yd.—Yard
FAHR.—Fahrenheit.		&.—and.
FCP.—Foolscap.		
F.D.—(Lat. <i>Fidei Defensor</i>) Defender of the Faith.		
FIG.—Figure.		
F.O.B.—Free on board.		
FR.—Foot or feet.		